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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|
|-----------------|-------------|----------------------|---------------------|

09/528,766 03/17/00 RADUE

M OMCO: 0056

QM02/0509

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EXAMINER

TORRENTE, D

ART UNIT

PAPER NUMBER

3746

DATE MAILED:

05/09/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/528,766

Applicant(s)

RADUE, MARTIN L.

Examiner

David J. Torrente

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3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 8 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Mowbray, et al. (4,300,873).
3. Mowbray discloses a reciprocating fuel pump comprising a resonant drive system including a resonant coil assembly (28) and a permanent magnet (29), one of the resonant coil assembly and the permanent magnet being disposed in a fixed position and the other of the resonant coil assembly and permanent magnet being movable reciprocally by application of electrical current to the resonant coil assembly, the drive system further comprising a drive member (27) secured to and movable reciprocally with either the coil assembly or the permanent magnet, a pump assembly adjacent to the drive system, the drive member extending into the pump assembly for generating increases and decreases in fluid pressure within the pump assembly during reciprocal movement to draw fuel into the pump assembly and to express fuel therefrom.
4. Mowbray's drive system includes a permanent magnet (29) and a resonant coil assembly (28), the coil assembly being energizable to cause reciprocal movement of a drive member (27), and a pump assembly disposed adjacent to the drive system, the pump assembly including means (18) for admitting a supply of fluid into an inner volume of the pump assembly, means (12) for

pressurizing the inner volume by reciprocal movement of the drive member, and means (20) for expressing pressurized fluid from the inner volume. [Claim 15]

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-7, 9-14 and 16-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mowbray, et al. (4,300,873).

7. Mowbray discloses a reciprocating fuel pump comprising a housing assembly (10) including a drive section (25) and a pump section. A drive assembly is disposed in the drive section, the drive assembly including a permanent magnet (29) and a coil assembly (28) having a winding and disposed within the central volume of the drive section adjacent to the permanent magnet. A pump member (12) is secured to and movable reciprocally with the coil assembly, the pump member extending into the pump section to produce pressure variations in the pump section during reciprocal movement to draw fuel into the pump section and to express fuel therefrom.

8. The coil assembly of Mowbray is not movable reciprocally axially along a central axis upon application of alternating current power to the winding, it is the permanent magnet which is movable. However, one of ordinary skill in the art at the time the invention was made would recognize the interchangeability of the magnet and coil to actuate the pump. Therefore, it would

have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the pump of Mowbray by interchanging the permanent magnet and coil since that arrangement is an art-recognized equivalent to Mowbray's arrangement. [Claim 1]

9. In an obvious variant of Mowbray, described above, the permanent magnet surrounds a portion of the central volume and extends generally along a central axis, and wherein the coil assembly is disposed radially within the portion of the central volume. [Claim 2] The permanent magnet is disposed adjacent to an end of the drive section, and wherein the coil assembly is disposed between the permanent magnet and the pump section. [Claim 3] The permanent magnet includes at least one magnet element (29). [Claim 4] The pump member includes a tubular member (12) extending from the coil assembly through a sealed bore (11) into the pump section. [Claim 5] The pump section includes an inlet check valve (18) and an outlet check valve (20), the inlet and outlet check valves being actuated by pressure variations produced by reciprocal movement of the pump member in the pump section. [Claim 6] Mowbray further comprises a nozzle (19) in fluid communication with the pump section for expressing pressurized fuel from the pump section. [Claim 7]

10. Claim 8 is anticipated by Mowbray as noted above. The coil assembly of Mowbray is not movable reciprocally axially along a central axis upon application of alternating current power to the winding, it is the permanent magnet which is movable. However, one of ordinary skill in the art at the time the invention was made would recognize the interchangeability of the magnet and coil to actuate the pump. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the pump of Mowbray by interchanging the permanent magnet and coil since that arrangement is an art-recognized

equivalent to Mowbray's arrangement. In such an obvious variant of Mowbray, described above, the permanent magnet surrounds a portion of the central volume and extends generally along a central axis, and wherein the coil assembly is disposed radially within the portion of the central volume. [Claim 9] The permanent magnet is disposed adjacent to an end of the drive section, and wherein the coil assembly is disposed between the permanent magnet and the pump section. [Claim 10] The permanent magnet includes at least one magnet element (29). [Claim 11] The pump member includes a tubular member (12) extending from the coil assembly through a sealed bore (11) into the pump section. [Claim 12] The pump section includes an inlet check valve (18) and an outlet check valve (20), the inlet and outlet check valves being actuated by pressure variations produced by reciprocal movement of the pump member in the pump section. [Claim 13] Mowbray further comprises a nozzle (19) in fluid communication with the pump section for expressing pressurized fuel from the pump section. [Claim 14]

11. Claim 15 is anticipated by Mowbray as noted above. The permanent magnet is not disposed in a fixed location within the drive system at least partially surrounding a central volume thereof and extending generally along a central axis, and wherein the coil assembly is disposed movably within the portion of the central volume. Mowbray discloses a reverse arrangement, wherein a fixed coil assembly surrounds the permanent magnet. However, one of ordinary skill in the art at the time the invention was made would recognize the interchangeability of the magnet and coil to actuate the pump. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the pump of Mowbray by interchanging the permanent magnet and coil since that arrangement is an art-recognized equivalent to Mowbray's arrangement. In such an obvious variant of

Mowbray, described above, the permanent magnet surrounds a portion of the central volume and extends generally along a central axis, and wherein the coil assembly is disposed movably radially within the portion of the central volume. [Claim 16] Further, such an obvious variant would exhibit the permanent magnet is disposed in a fixed location adjacent to an end of the drive system, and wherein the coil assembly is disposed between the permanent magnet and the pump assembly. [Claim 17]

12. The permanent magnet includes only one magnet elements, however duplication of parts where the operation of the apparatus remains unchanged has been held to be within the level of ordinary skill in the art. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide two magnets in place of Mowbray's one in order to multiply the magnetic field effect. [Claim 18] The drive member includes a tubular member (27) extending from the coil assembly through a sealed bore into the pump assembly. [Claim 19] Mowbray exhibits means for admitting a supply of fluid into an inner volume of the pump assembly includes a check valve closed by an increase in pressure within the inner volume during operation. [Claim 20] Means for pressurizing the inner volume by reciprocal movement of the drive member includes a portion of the drive member. [Claim 21] The drive member (27) is a tubular element and the means for pressurizing the inner volume includes a valve element (12) which seats to seal an inner passageway (11) of the drive member during a pressure stroke thereof. [Claim 22] The means for expressing pressurized fluid from the inner volume includes an outlet check valve (20) biased into a closed position and opened by an increase in pressure within the inner volume during operation. [Claim 23] Mowbray further comprises a nozzle (19)

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in fluid communication with the pump assembly for expressing pressurized fluid from the pump assembly.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Radue, et al. (6,109,549)
- Yoshida, et al. (5,080,079)
- Haeck (4,308,475)
- Binversie, et al. (5,630,401)
- Bottoms (4,345,565)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David J. Torrente whose telephone number is (703) 306-5535. The examiner can normally be reached on M-F, 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on (703) 308-0102. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7764 for regular communications and (703) 308-7763 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0861.

DJT
May 7, 2001




Timothy S. Thorpe
Supervisory Patent Examiner
Group 3700